ABSTRACT

A polyhydroxyalkanoate copolymer comprises one kind of unit of

$-[OCH((CH_2)_x-SOC_6H_5R)CH_2CO]-$ (n=1-7) (1)

(wherein R is any one of H, halogen, CN, NO_2, COOR′, SO_2R'' (R′ is any one of H, Na, K, CH_3 and C_2H_5; R′′ is any one of OH, ONa, OK, halogen, OCH_3 and OC_2H_5), CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH and $(CH_3)_3$-C) and

$-[OCH((CH_2)_x-SO_2C_6H_5R)CH_2CO]-$ (n=1-7) (2)

(wherein R is any one of H, halogen, CN, NO_2, COO R′, SO_2R'' (R′ is any one of H, Na, K, CH_3 and C_2H_5; R′′ is any one of OH, ONa, OK, halogen, OCH_3 and OC_2H_5), CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH and $(CH_3)_3$-C)

and at least one unit of chemical formulae (3) to (6):

$-[OCH((CH_2)_m-Rz)CH_2CO]-$ (n=1-8) (3)

(wherein Rz comprises a residue having either a phenyl structure or a thienyl structure),

$-[OCH((CH_2)_k-C_6H_{11}Ra)CH_2CO]-$ (n=1-8) (4)

(wherein R_a is any one of H, CN, NO_2, halogen, CH_3, C_2H_5, C_3H_7, CF_3, C_2F_5 and C_3F_7)

$-[OCH((CH_2)_n-CH=CH_2)CH_2CO]-$ (n=1-8) (5), and

$-[OCH((CH_2)_n-COORb)CH_2CO]-$ (n=1-8) (6)

(wherein R_b is any one of H, Na and K).